

ASTRONOMY

Venus Becoming Prominent

Three other planets, Jupiter, Saturn and Mars, are also visible during the early spring nights. The ruddy planet is now increasing in brightness as it rapidly approaches the earth.

By JAMES STOKLEY

▶ ALTHOUGH GLIMPSES of Venus might have been caught during March as that planet stood low in the west just after sunset, it has now moved well away from the sun and will become a prominent object in the western sky during April.

At the beginning of the month, it sets a little more than an hour after the sun, before the sky has become completely dark. By the end of April, however, it will be seen, low in the west, in a really dark sky, setting about two hours after the sun.

The accompanying maps show the appearance of the skies at about ten p.m., your own kind of standard time, on April 1, an hour earlier at the middle and two hours earlier at the end of the month. Venus sets too early to be shown, but it is in the constellation of Aries, the ram, just below Taurus, the bull, which is depicted in the west.

Jupiter Also Visible

Taurus is the location, as it has been for many months, of Jupiter. Although very bright, of magnitude minus 1.6 on the astronomer's scale of brilliance, it is only about a fifth of the brightness of Venus, with magnitude minus 3.3. Jupiter is visible through the evening, setting around midnight.

Over in the southeast appears the third of our evening planets, Saturn, whose position, in Libra, the scales, is shown on the maps. Its magnitude is 0.4, about a third as bright as Jupiter, although it still ranks with the first magnitude stars. One of these is Spica, in Virgo, the virgin, just above and to the right.

High in the south is the constellation of Leo, the lion, with its sub-group, the Sickle, of which the blade is supposed to form the lion's head. Farther to the right is the figure of Gemini, the twins, with first-magnitude Pollux.

A little lower is Procyon, in Canis Minor, the lesser dog; and still lower we find the greater dog, Canis Major, with Sirius. To the right of this group we find Orion, the warrior. Part of him is below the horizon, but Betelgeuse, in one of his shoulders, still shows.

To the right of Orion is Taurus, where Jupiter now stands, and in which is the star Aldebaran, near the horizon. To the right of Jupiter is Auriga, the charioteer, with brilliant Capella.

High in the northern sky we find Ursa

Major, in which is the septet of stars called the great dipper. The two stars in the bowl, farthest left, are the pointers, whose direction indicates the way to the pole star, Polaris, in Ursa Minor, the lesser bear. The curved handle of the dipper is also a signpost. If its curve is followed around to the east you come to Arcturus, in Boötes, the bear-driver, sometimes called the herdsman.

Around midnight a fourth planet comes into view. This is Mars, which is in Sagittarius, the archer. Now rapidly approaching us, it is also increasing in brightness. On April 1, with a distance of 88,827,000 miles, its magnitude is 0.1. On the 30th it will have approached to less than 65,776,000 miles, and increased its brightness nearly twice, to magnitude minus 0.6.

Mars Coming Closer

During the following months, it will continue to approach and brighten until June 21, when it will be 40,160,000 miles away and of magnitude minus 2.3, nearly ten times as bright as at present.

Of all the planets that, like the earth, revolve about the sun, Jupiter is the largest. Its diameter is 87,000 miles, or about 11 times that of the earth, whose diameter is 7,918 miles. Among its other claims to fame is that it has the largest family of satellites, or moons. Twelve are now known, and as the most recent was discovered in 1951, it may well be that there are still more which future telescopic research will reveal.

Four were discovered in 1610 by the Italian astronomer Galileo, who was the first to use the recently invented telescope on the stars, and to appreciate what he saw. Actually, a German named Simon Marius had a telescope and looked at Jupi-

ter with it a year or so earlier. He had seen what he supposed were faint stars close to the planet.

After Galileo announced his discovery, Marius published a book in which he claimed priority, but this is not granted to him by modern historians of science.

Three of these four Galilean moons, to which the names Io, Europa, Ganymede and Callisto have been given, are larger than our own moon. The smallest, Europa, is only slightly smaller, about 2,000 miles as compared with 2,160 for ours. Io is about 2,300 miles in diameter, while Ganymede and Callisto are each about 3,200 miles, appreciably larger than Mercury, which has a diameter of 3,010 miles.

Eight Discovered Recently

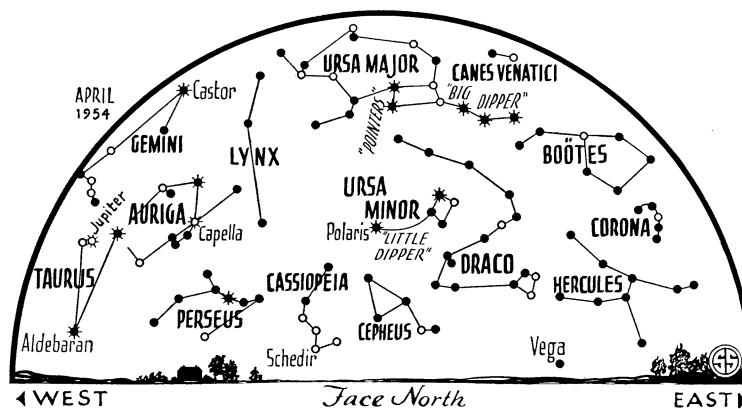
The other eight moons of Jupiter have been discovered in modern times. No names are given them, but they are known by Roman numerals from V to XII, in order of discovery. Sometimes, in fact, the four named ones are also designated in a similar way, from I to IV.

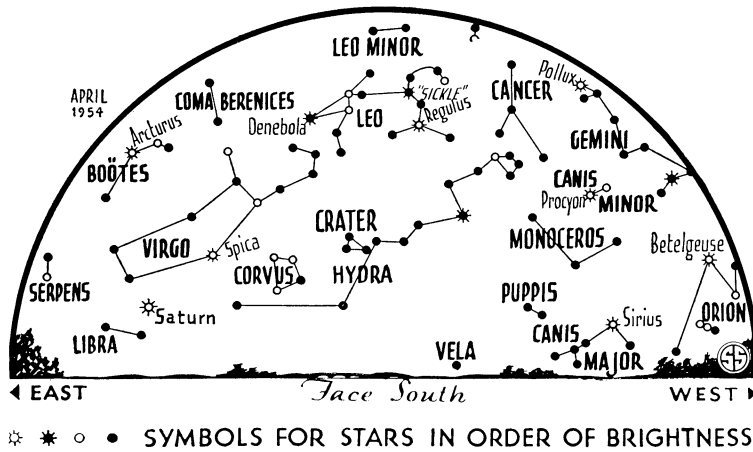
Of moons V to XII, only VIII was discovered by an astronomer not at a California observatory. An English astronomer, P. Melotte, picked this up with one of the telescopes at the Royal Observatory, Greenwich, in 1908.

Edward E. Barnard was on the staff of the Lick Observatory of the University of California in 1892, when he found V. In December, 1904, and January, 1905, at the same observatory, Dr. C. D. Perrine found VI and VII.

In 1914, also at Lick, Dr. Seth B. Nicholson found IX. In 1938 Dr. Nicholson, by that time at the Mt. Wilson Observatory in southern California, found two more, X and XI. Then he found XII in 1951, thus tying Galileo for first place.

However, his moons, like all those discovered in modern times, are quite small. Their sizes are not known with accuracy, although V and VI have been estimated to





be about 100 miles in diameter. The others are even smaller, and XII may not be more than about 15 miles in diameter.

While the small satellites are incapable of causing eclipses of the sun on Jupiter, the four large ones can. In fact, with telescopes on the earth we can often observe these, and see the shadows of these moons, as well as the moons themselves, moving across the face of the planet.

Sometimes the moons are themselves eclipsed, as they pass through Jupiter's shadow. And sometimes they are hidden, or occulted, as they go behind Jupiter.

These effects were observed with early telescopes, within 50 years or so after the moons were discovered, but it was found difficult to predict their occurrence with precision. Sometimes they would be ahead of schedule, sometimes behind.

This was explained in 1675 by a Danish astronomer, Olaus Roemer, who noticed that they were early when the earth was on the same side of the sun as Jupiter. On the other hand, when earth was far on the opposite side of its orbit from Jupiter, they would occur about 16 minutes later.

Roemer therefore concluded, correctly, that light took about 16 minutes to travel the diameter of the earth's orbit. When we

were in the part toward Jupiter, the light rays telling us about the eclipse reached us that much sooner than when we were farther away.

Since the velocity of light, about 186,000 miles per second, is one of the most important constants of nature, and because this was the first determination of its value, Roemer's discovery ranks among the great events in the history of science.

Celestial Time Table for April

April	EST	
3	7:25 a.m.	New moon.
	3:00 p.m.	Moon nearest, distance 221,900 miles.
4	1:28 p.m.	Moon passes Venus.
7	9:34 p.m.	Moon passes Jupiter.
10	12:05 a.m.	Moon in first quarter.
14	12:00 midnight	Planet Neptune (not visible with naked eye) nearest earth, distance 2,723,000,000 miles.
17	3:00 p.m.	Moon farthest, distance 252,600 miles.
18	12:48 a.m.	Full moon.
19	12:01 a.m.	Moon passes Saturn.
23	12:20 p.m.	Moon passes Mars.
25	11:57 p.m.	Moon in last quarter.
26	3:00 p.m.	Saturn nearest, distance 817,900,000 miles.

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, March 27, 1954

OPHTHALMOLOGY

Young Eyes Vulnerable

➤ EYES ARE most "vulnerable" in the pre-school years when they are going through their greatest period of development, Dr. Walter H. Fink of Minneapolis reported at the sight-saving conference of the National Society for the Prevention of Blindness in St. Louis.

This points up the "vital importance" of early care of eyesight, he declared. Neglect is causing thousands of American school children to suffer irreparable damage to their eyesight, he charged.

He warned parents not to rely on simple eye tests using charts as proof of healthy vision. Eye defects, he declared, often occur in children whose sight shows 20/20 on tests.

Every child, when he reaches the age of two years, should have his eyes screened by an eye specialist, he advised. In this way defects can be detected and treated in time to prevent "irreparable damage which results when bad habits become deeply ingrained and when the eyes are in a less plastic state."

Dr. Fink also warned parents not to think that crossed eyes are outgrown. Treatment should be started the moment the condition is recognized, even though the child is under one year old, he advised.

From 20% to 25% of children of school age have eye defects, he reported on the basis of recent surveys.

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